ON THE PERFORMANCE OF PROFILE EXTRUSION DIES

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One of the challenging tasks on the design of profile extrusion dies is the achievement of an even flow distribution that guarantees process reproducibility and quality of the final product. For this purpose, several strategies can be employed to ensure that a balanced flow is attained, by adjusting the thickness and/or length of the die land or by employing flow separators. Such strategies have a direct influence on the sensitivity of the performance of the forming tool; apart from the processing conditions and material properties, inaccuracies originated in the machining stage of the extrusion die also play an important role.

From a pragmatic and economical point of view, the above mentioned parameters are difficult to control during the construction and production phases, thus being important to evaluate their effect on the performance of the tool, in order to help the designer identifying the most appropriate strategy to adopt in the design of the tool. This work presents a study performed with an in-house 3D numerical modelling code, used to evaluate the sensitivity of extrusion dies, optimized with alternative strategies, to process parameters, such as machining inaccuracies, melt rheology and processing conditions.